



47884 – MECHANISM DESIGN

ALI SHOURIDEH

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**Office:** TEP 5103 on Zoom!!!

**Office Hours:** by appointment.

**Class room number:** N. A.

**Class times:** MON-WEDNESDAY 2:10PM - 4:00PM

## Course Description

This is an advanced class on mechanism design and its application. Mechanism design shows up in pretty much all areas of economics, OR, CS, political science etc, when decision makers interact and we are concerned about their incentives. Our focus will be on recent theoretical techniques in mechanism design with some of their applications to pricing, auctions, regulations. Part of the course will come into contact with material from computer science given that there is considerable recent overlap between the areas.

## Thursday Coffee Hours

Every thursday at 3pm, I am going to be on Zoom having a coffee. Stop by to talk about mechanism design or anything else.

## Course Materials

There is no textbook for this class as we will focus more on papers. However, you might want to look at the following:

An Introduction to the Theory of Mechanism Design, 2015, Tilman Borgers, Oxford University Press

Mechanism Theory, 2003, Matthew Jackson



I, often, find Nobel prize announcement to be a very good review of the literature. Here are quite a few related to mechanism design:

**Improvements to auction theory and inventions of new auction formats**; Scientific background for the 2020 Nobel Prize to Milgrom and Wilson

**Market Power and Regulation**; Scientific background for the 2014 Nobel Prize to Tirole

**Mechanism Design Theory**; Scientific background for the 2007 Nobel Prize to Hurwicz, Maskin, and Myerson

**Information and Incentives**; ; Scientific background for the 1996 Nobel Prize to Mirrlees and Vickrey

## Grading

Grading will be based on:

1. Homeworks, 45%
2. Referee reports, 20%
3. Final Project, 35%

### Homeworks

There will be a total of 2 or 3 written home works.

### Referee Reports

You will have to write 2 referee reports on 2 unpublished papers broadly related to the topics discussed dated after and including 2010. You should confirm your choice with me.

### Final Project

During the semester, you have to choose a research question of your interest - obviously related to the topics discussed in class; come up with one or two papers that are related and summarize them and finally flesh out a new idea on how to answer your question in a way that is new to the literature. Once the mini is over, we meet for a session with student presentations.

## Schedule and course outline

The following is a tentative schedule of topics and papers to be covered;

### Foundations

Mathematical Preliminaries: General Envelope Theorem, Calculus of Variation



### **Mechanism Design and the Revelation Principle**

Myerson (Econometrica, 79)

Myerson (Econometrica 86)

### **Bilateral Trade and Pricing**

Mussa and Rosen (JET, 78)

Myerson, R. and M. Satterthwaite (JET 83)

### **Optimal Auctions**

VCG Auction

Myerson, R. B. (Math of OR 81)

Cremer and McLean (Econometrica 88)

Bulow and Klemperer (AER 96)

### **Random Topics**

#### **Robustness and Complexity**

Carroll (Econometrica 2017)

Morgenstern and Roughgarden (NIPS 2015)

Hartline and Roughgarden (EC 2009)

Akbarpour, Kominers, Li, Milgrom (2020)

#### **Behavioral Mechanism Design**

Galperti (Econometrica 2015)

Heidhues and Koszegi (QJE 2017)

Madarasz and Prat (Restud 2017)

#### **Multi-dimensional Mechanism Design**

Daskalakis, Deckelbaum, Tzamos (Econometrica, 2015)

Kushnir and Shourideh (2020)